

## PROSTAGLANDIN E<sub>2</sub> GEL SUPPLEMENTED/ UNSUPPLEMENTED WITH ORAL PGE<sub>2</sub> IN INDUCTION OF LABOUR IN HIGH RISK PREGNANCY

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### SUMMARY

PGE<sub>2</sub> intracervical gel was used for induction of labour in 100 high risk pregnant women. It acted as inducing agent in 60% women and the mean Bishop score improved in rest 40% cases from 4.5 to 7.4. Thirty three percent of these 40% on supplementation with oral PGE<sub>2</sub> after ARM had vaginal deliveries while in 7% caesarean sections were required. Nausea and vomiting occurred in 7% women. One (1%) case had uterine hypertonus.

### INTRODUCTION

Elective induction of labour in high risk pregnancy is always desired to ensure the satisfactory perinatal outcome. The cervix is often unfavourable in these cases at the time of induction and this presents a great challenge in successful induction of labour. Recently, prostaglandins have revolutionised the labour induction technique, especially in unfavourable cervical conditions.

Efforts are still on to find out the best route for its administration and the role of oral PGE<sub>2</sub> in augmentation of labour. Present study was undertaken to investigate the :

- (i) Effectivity of cervical application of PGE<sub>2</sub> gel as inducing agent.
- (ii) Role of oral PGE<sub>2</sub> as augmenting agent after priming the cervix with PGE<sub>2</sub> gel.

### MATERIAL AND METHOD

One hundred pregnant women with one

or more high risk factors were selected from the admitted patients for induction of labour. The criteria for selection of cases were :

(i) Gestational age >36 weeks with cephalic presentation and intact membranes.

(ii) Parity between 0-4

(iii) Single pregnancy.

**Exclusion criteria**

(i) Previous uterine and/or urinary bladder surgery.

(ii) Placenta praevia in present pregnancy.

(iii) Intra-uterine death

(iv) Prostaglandins hypersensitivity.

**Gel application**

After detailed ultrasonic examination, informed consent was taken. Bishop score was determined and pelvic assessment was done. When the pelvis was found to be adequate, 0.5 mg PGE<sub>2</sub> in 2.5 ml of gel was instilled in cervical canal. Patient was kept in recumbent position for 30 minutes and was monitored for uterine contractions, foetal heart rate and vital signs every 1/2 hrly for 6 hours. Monitoring was continued as for active labour, if labour supervened in this period.

**Oral PGE<sub>2</sub> administration for augmentation of labour**

In those patients who did not go into active labour, Bishop score was reassessed after 12 hours. ARM was done and 0.5mg PGE<sub>2</sub> per hour was administered orally. If labour pains were not induced within 4 hours, then the dose of oral prostaglandins was doubled to 1mg per hour. The dose was reduced to 0.5mg per hour, once the patient was in active labour and

continued till delivery.

**RESULTS**

The ages of the selected patients ranged between 19 to 38 years. The mean age was 24.80 + 4.14 years. Sixty-one (61%) were primigravida and 39% were multigravida. The majority (23%) of multigravida were second gravida. The mean POG at the time of induction was 38W5D + 1.52 weeks. The mean preinduction Bishop score was 4.56 + 1.56. In primigravidae mean Bishop score was 4.4 + 1.5 (42 primigravidae had unfavourable cervix while 19 had favourable cervix). In multigravidae (39%) mean Bishop score was 4.67 + 1.58 and 25 of these had unfavourable cervix prior to application of gel. The indications for induction are listed in Table I. The most common were PIH (27%) and IUGR (25%). In 22% there were more than one indications.

Seventy-two percent patients started having labour pains within 4 hours of gel instillation and 60% (31 primigravida and 29 multigravida) progressed into active labour and had normal unassisted vaginal deliveries within 24 hours. Thirty-one (31%) of these delivered within 12 hours. The mean instillation delivery interval was 10 hours 32 minutes (10.55 + 3.48 hours). The corresponding intervals for primigravidae and multigravidae were 11hr 21 min and 9 hr 40 min respectively. One patient (1%) had cervical tear due to uterine hypertonicity. (The total duration of labour in this case was 5 hrs

**Table I**  
**INDICATIONS FOR INDUCTIONS**

Indication for Induction	No.(%) of Pts with one factor	No of Pts with More than one factor
PIH	27 (27%)	14
IUGR	25 (25%)	19
Postmaturity	10 (10%)	3
BOH	9 (9%)	5
Elderly	4 (4%)	3
Primigravida		
Essential Hypertension	3 (3%)	3
<b>Total</b>	<b>78(78%)</b>	<b>47* (22%)</b>

\* Three cases had 3-indications  
Ninteen cases had 2-indications

**Table II**  
**CHANGE IN BISHOP SCORE 12 HRS AFTER PGE<sub>2</sub> APPLICATION**

Author	Year	No. of pts	Mean Bishop Score	
			Before	After
Thiery et al	1984	40	3.4	6.6
Patki et al	1994	40	2.6	5.0
Daftary et al	1994	60	3.2	7.6
Present study	1996	100	4.5	7.4

05min, the second and third stages of labour were less than 5min.).

**Augmentation with oral prostaglandins**

Forty percent (30 primigravida and 10 multigravida) cases who did not go into acitve labour with prostaglandin gel and reassessment of Bishop score after 12 hours

**Table III**  
**LABOUR OUTCOME**

Author	Year	Total No. of cases	No. of cases Delivered Vaginally	No. of CS	% of CS
Nimrod et al	1984	15	14	1	6.6%
Patki et al	1993	40	37	3	7.5%
Daftary et al	1994	60	48	12	20%
Handa et al	1994	126	108	18	14.3%
Present study	1996	100	93	7	7%

and the mean Bishop score increased from 4.5 to 7.4 in these cases (Table II). The labour was augmented with oral PGE<sub>2</sub> after ARM. The mean dose of oral PGE<sub>2</sub> required to complete the labour was 4.30mg. The maximum single dose of 1 mg per hour was required in only 2 (5%) cases. The mean period of onset of labour was 53 minutes. It was 49 minutes in primigravidae and 63 minutes in multigravidae. Thirty-three (82.5%) of 40 women had vaginal deliveries, 7 (17.5%) of these were forceps assisted deliveries. The mean IDI was 8.34 + 3.04 (Range : 2 hr 50 min to 15 hr 48 min) hrs. The mean IDI in (9) multigravidae was 6.0 hours and in (24) primigravidae was 7 hour 08 minutes. Caesarean deliveries rate (7) was 17.5% and the indications for caesarean section were foetal distress (1 case) non-progress of labour (5 cases, ROP-1 case, cord around neck 1 case and uterine inertia in 3 cases). Both factors were co-existing in another case who had a thick septum between the presenting part and

internal os.

The mean Apgar scores at 1 and 5 minutes were 6.5 + 1.2 and 8.4 + 1.1 respectively. The mean birth weight was 2567 + 440 gms. Seven (7%) patients had nausea and vomiting and all were selflimiting. There was one (1%) neonatal death on 4th postnatal day. The apgar score was 2 at 1 minute in this case and was resuscitated with endotracheal intubation. One (1%) case had uterine hypertonus. Overall failure rate (caesarean section rate) was 7% (Table III).

#### DISCUSSION

Calder and Embrey (1973) suggested that local application of prostaglandins was an effective method of induction of labour. Ulmsten et al (1983) found that endocervical application of PGE<sub>2</sub> gel was safe, had minimum side effects with negligible incidence of uterine hypertonus. Daftary et al (1994) observed that cerviprime is effective inducing agent and oral PGE<sub>2</sub> when coupled with it is effective in maintaining the progress of labour.

**Table IV**  
**DISTRIBUTION OF PATIENTS DELIVERED VAGINALLY**

	Primi Gravida	Multi Gravida	Overall (%)
Total No. of patients	61	39	100
Delivered within 12 hrs of application of gel.	18	21	39 (39%)
Delivered within 24 hrs of application of gel	13	8	21 (21%)
Mean inst-delivery Interval	11 Hr 21 Min	9 Hr 40 Min	10 Hr 32 Min
Augmented with ARM and PGE <sub>2</sub>	30	10	40 (40%)
Normal Vaginal Deliveries	48	38	86 (86%)
Assisted Vaginal del.	7	-	7 (7%)
Caesarean section	6	1	7 (7%)
IDI	8 Hr 5 Min	6 Hr 52 Min	8 Hr 34 Min

In the present study cervical application of PGE<sub>2</sub> gel acted as inducing agent in 60% of total induced patients. The incidences of successful inductions in previous studies were 60% (Nimrod et al, 1984); 43.3% (Daftary et al, 1994) and 73% (Handa et al, 1994). The preinduction Bishop scores in the study of Nimrod et al (1984) and Handa et al (1994) were < 4 and it was 3.2 in the study of Daftary et al (1994) while in the present study mean Bishop score was 4.5. In the remaining 40% women, the cervical score improved to 7.4 from

4.5 in the present study whereas Daftary et al (1994) reported the improvement from 3.2 to 7.6 in the same period (12 hours) as that of present study.

The labour was augmented with oral PGE<sub>2</sub> in the present study after ARM and 33 (82.5%) of remaining 40 women delivered vaginally within mean IDI of 8 hr 34 minutes which is close to IDI of 7 hrs and 51 minutes reported by Jina et al (1994). Only 7 (17.5%) of 40 remaining women required caesarean sections in emergency as compared to 12 (35.3%) of 34 patients in the

study of Daftary et al (1994). The mean dose required for augmentation of labour was 4.30mg as compared to 3 mg reported by Daftary et al (1994).

The overall caesarean section rate in the present was 7% (Table IV) which compares well with 6.6% reported by Nimrod et al (1984) while it is less 20% reported by Daftary et al (1994). The complication rate was 8% (7% had Nausea and vomiting while 1% had uterine hypertonus), which is significantly low when compared to 35% gastrointestinal symptoms and 5% uterine hypertonus reported by Daftary et al (1994). One (1%) perinatal death occurred in the present study.

### CONCLUSION

Intracervical PGE<sub>2</sub> gel application is a convenient, acceptable, safe and effective method of induction of labour in high risk

cases apart from conventionally thought as a ripening agent. The labour can be augmented after ARM successfully with oral administration of PGE<sub>2</sub> instead of IV oxytocin.

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